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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,317	10/18/2001	Arnab Das	129250-002120/US	6605

32498 7590 11/24/2006

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EXAMINER

MERED, HABTE

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/982,317	DAS ET AL.	
	Examiner	Art Unit	
	Habte Mered	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 September 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/18/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. The amendment filed on 05 September 2006 has been entered and fully considered.
2. Claims 1-6, 8, 11-14, and 17-19 are pending.
3. The Applicant has currently amended Claims 1 and 14.
4. The Applicant has cancelled Claims 7, 9, 10, 15, 16, and 20.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-5, 8, 11-14, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty et al (US 6, 631, 124), hereinafter referred to as Koorapaty, in view of Odenwalder et al (US 6, 804, 220), hereinafter referred to as Odenwalder and Jalali et al (US 6, 952, 454), hereinafter referred to as Jalali.

*Koorapaty discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems.*

7. Regarding **claims 1 and 14**, Koorapaty discloses a method for transmitting information in a communication channel of a wireless communication system, the method comprising: dividing the communication channel into a plurality of time slots of equal duration according to a time division multiple access scheme (**See Figure 5A and Column 6, Lines 10-43; In Figure 5A for a given carrier frequency there are three**

**equal time slots 510 shown in Figure 5A) and sub-dividing, on other than a time division basis, each of the plurality of time slots to comprise two or more sub-slots according to CDMA scheme, wherein each of the two or more sub-slots, and transmitting two or more contiguous sub-slots to form a separate transmission (See Figure 5B, and Column 6, Lines 18-43; Koorapaty discloses in Figure 5B that an entire time slot 510 or a spreading code defined sub-channel 520a – 520n define variable number of contiguous time slots 510 and variable numbers of contiguous sub-slots in time slot 520.)**

Koorapaty fails to disclose transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with two time slots, where the number of sub-slots included in the transmission from each timeslot may vary from timeslot to timeslot.

*Jalali teaches the sharing of a transmission channel among different types of services that may have highly disparate data rate, delay, and quality of service by using time division multiplexing with orthogonal frequency division multiplexing.*

Jalali discloses transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with two time slots, where the number of sub-slots included in the transmission from each timeslot may vary from timeslot to timeslot. **(See Figure 2 and Columns 13:64-67 and 14:12-20, 40-45)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Koorapaty's method to incorporate a method of

transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with two time slots, where the number of sub-slots included in the transmission from each timeslot may vary from timeslot to timeslot. The motivation to have the ability to allocate a number of contiguous sub-slots encompassing different time slots is to allow the sharing of a transmission channel among different type of services that may have highly disparate data rate, delay, and quality of service as stated in Jalali Column 6:60-67 and in Koorapaty Column 2:50-57.

Koorapaty, however, fails to expressly disclose a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots.

*Odenwalder teaches a method and apparatus for generating control information for packet data and sending it on a control channel useful for various applications including CDMA (See Column 4, Lines 13-23)*

Odenwalder discloses a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted sub-slots. **(See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35)**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Koorapaty's method to incorporate a method of transmitting a separate control channel for each separate transmission, wherein the duration of the separating control channel is dependent upon the number of transmitted

sub-slots. The motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

8. Regarding **claims 2**, Koorapaty discloses a method, wherein each of the two or more contiguous sub-slots is separately transmitted according to a code division multiple access schemes. **(See Column 6, Lines 24-26)**

9. Regarding **claim 3**, Koorapaty discloses a method wherein, in any one of the plurality of time slots, each of a plurality of transmissions are separately coded and carried in a separate sub-slot simultaneously in such time slot. **(See Column 6, Lines 24-26)**

10. Regarding **claim 4**, Koorapaty discloses a method wherein each of the plurality of transmissions corresponds to a separate user of the wireless communication system. **(See Figure 5A; Terminals 1 to N constitute separate users in the system. See Column 6, Lines 24-26)**

11. Regarding **claim 5**, Koorapaty discloses a method wherein each off the plurality of transmissions corresponds to separate transmissions of a single user of the wireless communication system. **(See Figure 5A; Terminals 1 to N constitute single users in the system. See Column 6, Lines 24-26)**

12. Regarding **claim 8**, Koorapaty discloses a method, wherein the communication channel comprises time slots each having duration of 1.25 milliseconds and wherein

each of the time slots comprises at least two sub-slots. **(Koorapaty discloses in Figure 5B and further on Column 6, Lines 39-43 that each time slot can have several sub-channels. There is no restriction imposed on the duration of the time slot and can readily be 1.25 milliseconds.)**

13. Regarding **claim 11**, Koorapaty discloses all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH).

Odenwalder discloses a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH). **(See Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35)**

14. Regarding **claim 12**, Koorapaty teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission.

Odenwalder discloses a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

a sub-slot start field for identifying a sub-slot within a time slot in which a particular transmission starts; and

a sub-slot count field for identifying the total number of sub-slots that carry the particular transmission. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to the end user the number of sub-slots assigned to the user and where the number of sub-slots are and this particular inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)**

15. Regarding **claim 13**, Koorapaty teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts.

Odenwalder discloses a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH), and wherein each of the plurality of secondary packet data control channels (SPDCCH) identifies a sub-slot start position within a time slot in which a particular transmission starts. **(Odenwalder's system has to have a sub-slot count and start fields because it has to convey to**



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**the end user the number of sub-slots assigned to the user and the nature of this inherency is chronicled in Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35.)**

16. With respect to **claims 11-13**, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Koorapaty's method by including a forward packet data channel (F-PDCH), a forward secondary packet data control channel (SPDCCH), wherein the forward secondary packet data control channel (SPDCCH) includes a sub-slot count and start fields. The motivation being such use of control channel technique reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel which is further illustrated in Odenwalder in Column 1, Lines 53-67.

17. Regarding **claim 17**, Koorapaty discloses a method, wherein bandwidth in the communication channel is allocated on a fractional basis to carry a plurality of transmissions using a combination of a variable number of contiguous sub-slots and a variable number of contiguous time slots. **(See Figures 5A and 5B; See Column 3, Lines 20-58; and Column 6, Lines 18-45)**

18. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty in view of Odenwalder as applied to claim 1 above, and further in view of Toskala et al (US 6, 535, 503).

The combination of Koorapaty and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein

each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) scheme.

*Toskala like Koorapaty discloses a method and apparatus for allocating resources in hybrid TDMA communication Systems. The hybrid TDMA system primarily described by both Toskala and Koorapaty is TDMA/CDMA.*

Toskala shows that TDMA/FDMA is feasible and further discloses a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. **(See Column 1, Lines 40-50)**

It would have been obvious to one of ordinary skill in the art at the time of invention to practice FDMA/TDMA access in Koorapaty's method wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. One is motivated to use TDMA/FDMA in GSM systems as it is widely used in the international wireless market and GSM access method is based on both FDMA and TDMA.

19. **Claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koorapaty view of Odenwalder as applied to claim 1 above, and further in view of Malkamaki et al (US 5, 577, 024), hereinafter referred to as Malkamaki.

20. Regarding **claim 18**, the combination of Koorapaty and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions,

retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages.

*Malkamaki discloses a TDMA/CDMA system similar to Koorapaty but further incorporates Automatic Repeat request (ARQ) transmission scheme.*

Malkamaki discloses a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Since Malkamaki's system supports ARQ and also like Koorapaty's system allows sub-slots in a given time slot, it is possible to have 4 users sharing the time slot. Each user in the sub-slot can be sending new transmission, Acks, Nacks and multi-level ACK/NACK).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Koorapaty's and Odenwalder's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

21. Regarding **claim 19**, the combination of Koorapaty and Odenwalder, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot.

Malkamaki discloses a method, wherein a multi-level ACK/NACK message corresponds to multiple transmissions that end within the same time slot. (See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Malkamaki's system supports ARQ in an environment where multiple transmission within the same environment is allowed.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combination of Koorapaty's and Odenwalder's method to incorporate orthogonal ARQ transmission, the motivation being implementing an error correction system for users in a TDMA/CDMA system.

#### ***Response to Arguments***

22. Applicant's arguments filed on 05 September 2006 have been fully considered but they are not persuasive.

23. In the Remarks, on page 5, Applicant argues the combination of Koorapaty and Odenwalder fails to disclose, the amended limitation as claimed in independent claims 1 and 14, a transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub-slots included in the transmission from each time slot may vary from timeslot to timeslot, wherein the transmission has a separate control channel.

Examiner respectfully disagrees with Applicant's conclusion. It is the position of the Examiner that Jalali teaches in Figure 2 and Columns 13:64-67 and 14:12-20, 40-45 that a transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub-

slots included in the transmission from each time slot may vary from timeslot to timeslot, wherein the transmission has a separate control channel. Jalali further teaches the sub-slots in any time slot in Figure 2 can transmit control data for different transmissions. Specifically Jalali indicates in Column 14:12-19 that data on the control sub-slot and broadcast sub-slot is assumed to be broadcast normally to every user but can be directed to particular users for specific transmissions. Therefore it is possible to send to user 1 only control data specific to user 1 using the control sub-channel for transmission involving user 1 and likewise it is possible to send to user 2 only control data specific to user 2 using the broadcast sub-channel for transmission involving user 2 and therefore the limitation "wherein the transmission has a separate control channel" is adequately met. More over, the secondary reference, Odenwalder teaches the concept of the duration of a control channel per transmission is dependent on the number of sub-slots used to transmit data packets as claimed in claims 1 and 14.

### ***Conclusion***

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Mered whose telephone number is 571 272 6046. The examiner can normally be reached on Monday to Friday 9:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HM  
11-14-2006



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